

# ANNUAL WATER PROGRAM - TEWAUKON REFUGE

## I. 1973 Water Use Data

### IMPOUNDMENT DATA

#### Pool 1, Lake Tewaukon for Calendar Year 1973

Month	Minimum			Maximum		
	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)
Jan.	1146.30	1200	7500	1146.30	1200	7500
Feb.	1146.30	1200	7500	1146.30	1200	7500
Mar.	1146.30	1200	7500	1147.00	1240	8350
Apr.	1147.00	1240	8350	1147.25	1250	8605
May	1147.20	1250	8600	1147.30	1249	8740
June	1146.30	1200	7500	1147.50	1270	9000
July	1145.90	1170	7050	1146.20	1190	7400
Aug.	1145.80	1160	6900	1145.90	1170	7050
Sept.	1145.70	1155	6800	1145.80	1160	6900
Oct.	1145.70	1155	6800	1145.70	1155	6800
Nov.	1145.70	1155	6800	1145.70	1155	6800
Dec.	1145.70	1155	6800	1145.70	1155	6800

#### Pool 2, Cutler's Marsh for Calendar Year 1973

Month	Minimum			Maximum		
	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)
Jan.	1151.20	230	880	1151.20	230	880
Feb.	1151.20	230	880	1151.20	230	880
Mar.	1151.00	230	830	1151.20	230	880
Apr.	1148.40	110	310	1151.00	230	830
May.	1147.30	85	190	1148.40	110	310
June	1146.40	60	110	1147.30	85	190
July	1146.00	50	85	1146.30	60	100
Aug.	1146.00	50	85	1146.00	50	85
Sept.	1145.85	45	80	1146.00	50	85
Oct.	1145.70	45	70	1145.85	45	80
Nov.	1145.70	45	70	1145.70	45	70
Dec.	1145.70	45	70	1145.70	45	70

#### Pool 3, Maka Pool for Calendar Year 1973

Month	Minimum			Maximum		
	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)
Jan.	1151.30	34	110	1151.30	34	110
Feb.	1151.30	34	110	1151.30	34	110
Mar.	1151.30	34	110	1154.90	118	485
Apr.	1154.90	118	485	1155.25	119	520
May.	1155.00	118	495	1155.25	119	520
June	1154.00	113	380	1155.00	118	495
July	1153.75	112	350	1153.80	112	355
Aug.	1152.95	108	260	1153.75	112	350
Sept.	1152.80	107	245	1152.95	108	260
Oct.	1152.80	107	245	1152.80	107	245
Nov.	1152.70	106	235	1152.80	107	245
Dec.	1152.70	106	235	1152.70	106	235

Pool 4 for Calendar Year 1973

Month	Minimum			Maximum		
	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)
Jan.	1152.50	5	15	1152.50	5	15
Feb.	1152.50	5	15	1152.50	5	15
Mar.	1152.50	5	15	1155.20	20	105
Apr.	1155.20	20	105	1155.50	22	115
May.	1155.25	20	105	1155.50	22	115
June	1154.50	15	85	1155.25	20	105
July	1154.00	12	70	1154.20	12	70
Aug.	1153.00	8	50	1154.00	12	70
Sept.	1153.00	8	50	1153.00	8	50
Oct.	1153.00	8	50	1153.00	8	50
Nov.	1152.90	8	50	1153.00	8	50
Dec.	1152.90	8	50	1152.90	8	50

Pool 8, Hepi Lake for Calendar Year 1973

Month	Minimum			Maximum		
	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)
Jan.	1174.40	99	240	1174.40	99	240
Feb.	1174.40	99	240	1174.40	99	240
Mar.	1174.40	99	240	1174.80	104	285
Apr.	1174.63	102	260	1174.70	103	270
May	1174.33	97	230	1174.63	102	260
June	1174.00	91	205	1174.33	97	230
July	1173.70	87	190	1174.00	91	205
Aug.	1173.50	84	160	1173.70	87	190
Sept.	1173.40	83	150	1173.50	84	160
Oct.	1173.40	83	150	1173.40	83	150
Nov.	1173.40	83	150	1173.40	83	150
Dec.	1173.40	83	150	1173.40	83	150

Pool 11, West White Lake for Calendar Year 1973

Month	Minimum			Maximum		
	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)
Jan.	1149.50	62	145	1149.50	62	145
Feb.	1149.50	62	145	1149.50	62	145
Mar.	1149.50	62	145	1149.80	65	167
Apr.	1149.60	63	153	1149.70	64	161
May	1149.50	62	145	1149.60	63	153
June	1148.90	55	114	1149.50	62	145
July	1148.20	45	84	1148.90	55	114
Aug.	1147.90	40	64	1148.20	45	84
Sept.	1147.80	39	63	1147.90	40	64
Oct.	1147.70	38	57	1147.80	39	63
Nov.	1147.60	37	56	1147.70	38	57
Dec.	1147.60	37	56	1147.60	37	56

Pool 13, Mann Lake for Calendar Year 1973

Month	Minimum			Maximum		
	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)
Jan.	1208.30	55	240	1208.30	55	240
Feb.	1208.30	55	240	1208.30	55	240
Mar.	1208.30	55	240	1210.00	60	340
Apr.	1209.30	59	300	1210.00	60	340
May	1209.00	58	280	1209.30	59	300
June	1208.50	56	255	1209.00	58	280
July	1208.00	55	225	1208.40	56	250
Aug.	1207.70	54	210	1208.00	55	225
Sept.	1207.70	54	210	1207.70	54	210
Oct.	1207.70	54	210	1207.70	54	210
Nov.	1207.70	54	210	1207.70	54	210
Dec.	1207.70	54	210	1207.70	54	210

Pool 14, Sprague Lake for Calendar Year 1973

Month	Minimum			Maximum		
	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)	Elevation Ft.-msl	Area (acres)	Capacity (ac.-ft)
Jan.	1211.40	178	865	1211.40	178	865
Feb.	1211.40	178	865	1211.40	178	865
Mar.	1211.40	178	865	1212.88	185	1140
Apr.	1212.00	183	975	1212.28	184	1020
May	1212.00	183	975	1212.00	183	975
June	1211.70	181	915	1212.00	183	975
July	1211.00	175	795	1211.50	179	880
Aug.	1210.70	172	735	1211.00	175	795
Sept.	1210.30	168	660	1210.70	172	735
Oct.	1210.30	168	660	1210.40	175	680
Nov.	1210.40	175	680	1210.40	175	680
Dec.	1210.40	175	680	1210.40	175	680

Tewaukon Refuge, Consumptive Water Use for 1973

<u>Pool</u>	<u>A</u> <u>Avg.</u> <u>Annual</u> <u>Evap.</u>	<u>B</u> <u>1973</u> <u>Lake</u> <u>Rise</u>	<u>C</u> <u>Net</u> <u>Gain</u> <u>A+B</u>	<u>D</u> <u>Surface</u> <u>Acres</u>	<u>E</u> <u>Ac-Ft</u> <u>Gain</u> <u>CxD</u>	<u>F</u> <u>Outflow</u> <u>in</u> <u>Ac-Ft</u>	<u>G</u> <u>Total Outflow</u> <u>Ac-Ft</u> <u>E+F</u>
16	2.65	-.50	2.15	80	172	0	**
14	2.65	-1.00	1.65	177	292	Unk	**
13	2.65	-.60	2.05	56	115	U	**
12	2.65	-.30	2.35	57	134	0	**
11	2.65	-1.90	.75	51	38	0	**
10	2.65	-.50	2.15	6	13	0	**
9	2.65	-.20	2.45	5	12	0	**
8	2.65	-1.00	1.65	4	7	Unk	**
7A	2.65	-1.00	1.65	4	7	Unk	**
7	2.65	-2.00	.65	dry	000	Unk	**
6	2.65	-2.00	.65	5	3	Unk	**
5	2.65	-2.00	.65	7	5	Unk	**
4	2.65	.40	3.05	14	43	Unk	**
3A	2.65	1.10	3.75	6	23	Unk	**
3	2.65	1.40	4.05	113	458	Unk	**
2A	2.65	-3.00	-.35	10	0	Unk	**
2	2.65	-5.50	-2.85	77	0	Unk	**
1	2.65	-.60	2.05	1198	2456	473	**

\*\* Not calculated.

Small Impoundments, 1973 (Hepi Lake Drainage)  
(Minimum Monthly Elevations)

<u>Month</u>	<u>Pool 2A</u>	<u>Pool 3A</u>	<u>Pool 5</u>	<u>Pool 6</u>	<u>Pool 7</u>	<u>Pool 7A</u>
Jan	1152.00	1151.60	1155.95	1165.00	1167.40	dry
Feb	1152.00	1151.60	1155.95	1165.00	1167.40	dry
March	1150.80	1151.60	1155.95	1163.61	1167.40	dry
April	1150.52	1154.85	1157.00	1163.61	1168.00	dry
May	1150.40	1154.85	1156.88	1165.94	1167.80	1/3 full
June	1149.60	1154.10	dry	1165.11	dry	1/3 full
July	dry	1153.40	dry	dry	dry	1/3 full
Aug	dry	1152.70	dry	dry	dry	1 ft. water
Sept	dry	1152.70	dry	dry	dry	dry
Oct	dry	1152.75	dry	dry	dry	dry
Nov	dry	1152.70	dry	dry	dry	dry
Dec	dry	1152.70	dry	dry	dry	dry

Small Impoundments, 1973 (Hepi Lake Drainage)  
(Maximum Monthly Elevations)

<u>Month</u>	<u>Pool 2A</u>	<u>Pool 3A</u>	<u>Pool 5</u>	<u>Pool 6</u>	<u>Pool 7</u>	<u>Pool 7A</u>
Jan	1152.00	1151.60	1155.95	1165.00	1167.40	dry
Feb	1152.00	1151.60	1155.95	1165.00	1167.40	dry
March	1152.00	1154.85	1157.64	1166.69	1168.70	dry
April	1150.80	1155.25	1157.40	1166.28	1168.60	1/3 full
May	1150.52	1155.25	1157.00	1166.28	1168.00	1/3 full
June	1150.40	1154.85	1156.88	1165.94	1167.80	1/3 full
July	1149.40	1154.00	dry	1164.85	dry	1/3 full
Aug	dry	1153.40	dry	dry	dry	1 ft water
Sept	dry	1152.80	dry	dry	dry	dry
Oct	dry	1152.80	dry	dry	dry	dry
Nov	dry	1152.75	dry	dry	dry	dry
Dec	dry	1152.70	dry	dry	dry	dry

## SUMMARY OF 1973 WATER PROGRAM

### Spring Runoff

There wasn't much. Lake Tewaukon raised only 0.8 feet and no water ran over the dam. On June 10 we began to draw down Lake Tewaukon to reduce water in Parkers Bay in hopes of getting lower bids on construction to be done there. We drew the lake down from 1147.50 to 1146.30, or 1.2 feet off about 1200 acres. This is about 1440 AF. The USGS Cayuga gauging station recorded 348 acre feet in June and 125 acre feet in July for a total of 473 acre feet discharged past that point. Much of the rest must have seeped into the ground or remained stored in the river channel to that point.

### Summer Conditions

We maintained Pools 4, 2, 7, 6, 5 and 2A in drawdown as planned in the Annual Water Program. Because the summer was very dry, we wished we had more water on the refuge. However, some pools cannot be dried up in wet years and had been held full so long that drying up was necessary for greater waterfowl production in succeeding years.

Pools 4 and 2 grew heavy stands of golden dock, up to five feet tall. The cattail stands at the upper ends probably suffered due to drought which would be desirable. Pools 7, 6 and 5 were dried up and also grew golden dock. No cultivation was done in the bottoms, but cattail will be burned out before they are refilled.

We pumped some water off Hepi Lake to induce more waterfowl use of the shallower pool. We have held it various depths over the years, up to eight feet deep, and we are finding greatly increased waterfowl use with pools 18 inches deep and drying up. Hepi Lake was at this depth during the fall.

East White Lake finally dried up in June. The waterfowl and shorebird use of it was terrific until it was totally dry. In May it had 114 pairs of ducks on it, 19% of the refuge total. In late summer we lightly disced the bottom to reduce invading cattail and cottonwoods and seeded the outer zone to millet. This did fair and made some grain. The very outside or shoreline zone of about 40 feet in width did not grow any millet for some unknown reason. Most of the remainder of the lake bottom we seeded to rye for reflooding in 1974. We dozed a number of haystacks out into the pool bottom for loafing sites for ducks and potential goose nesting islands.

Pools 9 and 10 dried up naturally. We burned the cattail zone around Pool 9 and then cultivated the bottom and seeded it to millet. This made a good crop for flooding in 1974.

On the Sprague Lake Unit, Horseshoe Slough went dry and we raised a crop of millet in that.

None of the dry pool bottoms received any waterfowl use.

## 1974 ANNUAL WATER PROGRAM

The Water Program is described for the Tewaukon Unit and for the Sprague Lake Unit. The Tewaukon Unit is described according to water source: Wild Rice River, Direct; White Lake Watershed; and Hapi Lake Watershed.

### Tewaukon Unit

#### I. Wild Rice River Watershed, Direct

##### Pool 4

This will be partially flooded to inundate the golden dock at the lower end but to keep the cattail out of the water at the upper end. The pool can be dewatered in late summer for increased waterfowl use.

##### Pool 3

We hope to hold pool 3 as full as we can without water seeping through the "Nickeson Dike" to flood his private cropland. If that happens, we will have to dewater the pool to prevent further flooding. The best management would be to drown the cattail in Pool 3 but we do not expect to have enough water to do it.

##### Pool 2

This was in drawdown in 1973 and grew to golden dock. This should be flooded to perhaps two feet depth, and then probably drawn down a foot for the winter.

##### Pool 1

Lake Tewaukon should be held at 1147.0 to 1147.5. We had it down to 1145.7 for construction of Parker Bay dikes in 1973, but that is too risky for fish winter kill. We had no stored water to raise the level last winter and didn't get fall rains, either. We expect the construction should be coffer-dammed off and could be done with the lake higher.

##### Parker Bay

Hopefully, construction of the control structures on Parker Bay will be completed by mid summer. The main pool, 65 acres in size, should be pumped dry as soon as possible and the bottom shaped for proper dewatering into the structure. The bottom would have to be dry enough for equipment to work in it and that may not happen. If not, we will have to decide on an alternate course of action, which would probably be to use a dragline on mats. We might aerial seed Japanese millet onto the pool bottom as a food source for waterfowl or hopefully to aid in drying up the bottom.

## II. White Lake Watershed

### Pool 11 - West White Lake

There is little runoff for this pool and so it will have to remain unmanipulated. We will burn the heavy stand of cattail and phragmites to open up the shoreline for waterfowl use.

### Pool 12 - East White Lake

We had hoped for runoff to put about a foot of water in this pool but it does not appear it will happen. We are therefore going to filter water from Cuttlers Marsh through a gravel bed in the Dam 12 structure into Pool 12. We want to keep all minnows out of it but probably won't be successful. We should put 12 to 18 inches of water in East White Lake and then let evaporation take its course.

## III. Hepi Lake Watershed

### Pool 8

We feel this is most used by waterfowl when 18 to 12 inches deep. However, this is a potential trouble spot for DVE. Therefore, we should hold it about 3 to 4 feet deep after the pools downstream of it are filled.

### Pool 9

This is north of Hepi Lake and was dry and farmed to millet in 1973. If it does not get enough runoff to make it wet, we should let in about one foot of water from Hepi Lake, carefully screened to exclude minnows. If Hepi Lake does not get high enough to run in, we should pump the water in.

### Pool 10

This can be filled from Hepi Lake but we will let nature take its course here.

### Pool 7A

We will farm this in 1974 for reflooding in 1975. The cattail and phragmites we will burn off to reduce predator habitat. A drainage way will be dug through it to facilitate dewatering Hepi Lake should DVE break out.

### Pools 7, 6 and 5

We will burn the cattail in the upper ends of these pools and then flood them full. All can be dewatered in late summer.



Pools 3A and 2A

Same as Pools 7, 6 and 5. They should be dewatered for the winter to keep muskrats out of the dikes.

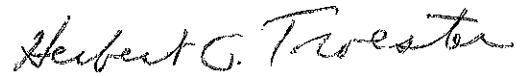
Sprague Lake, Mann Lake and Pool 16

No control structures exist so no management of elevations is possible.

Mann Lake, about 50 acres in size, should be diked off and dewatered by pumping for waterfowl use. This would not take much construction and could be done on a force account basis.

Pool 16, or Horseshoe Slough, lies north of the Wild Rice River. We now own most of the land here and should put in some low dikes in preparation for flooding the area as per the Master Plan. This should be done while the area is dry, as it is now. A separate letter has been written to the Area Office on this in reply to potential projects for National Guard construction battalions.

June 11, 1974



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Refuge Manager